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PETER COLLIER, DIRECTOR.

BULLETIN No. 81—NEW SERIES.

DECEMBER, 1894.

VARIETY TESTS WITH BLACKBERRIES, DEWBERRIES AND RASPBERRIES.
RASPBERRY ANTHRACNOSE.

GENEVA, N. Y.

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BULLETIN NO. 81—NEW SERIES.

VARIETY TESTS WITH BLACKBERRIES, DEWBERRIES AND RASPBERRIES.

The following pages are devoted to a brief account of the blackberries, dewberries and raspberries grown on the Station plots in 1894 together with a preliminary account of an extensive experiment in treating raspberry anthracnose.

Full descriptions of the varieties that fruited in 1893 were given in Bulletin No. 63, and in the Annual Report of this Station for 1893, either of which may be had on application. In this bulletin only those varieties are described that are new, or that have fruited at this Station for the first time this season.

BLACKBERRIES.—NOTES ON VARIETIES.

EARLY KING. *From Ellwanger and Barry, Rochester, N. Y., 1892.* Canes moderately vigorous, purplish red when mature; prickles long and abundant. Berries medium or above, roundish, with medium sized grains. Fruit nearly sweet and of fair flavor and quality. Ripens very early.

FRUITLAND. *From W. N. Scarf, New Carlisle, O., 1892.* Canes strong, upright, with greenish red bark; prickles moderately abundant. Fruit medium, nearly round, with medium to large grains, sweet, good quality and very good flavor.

Ford's No. 1. *From Frank Ford & Son, Ravenna, O., 1892.* Canes rather large but not thrifty, upright, with dull red or greenish bark, and few prickles. Fruit medium with medium to large grains; roundish, sub-acid, coarse core and poor quality.

Mersereau's Seedling. *From J. M. Mersereau, Cayuga, N. Y., 1893.* Berries roundish, medium size, with medium grains; somewhat seedy, nearly sweet, fair quality.

OHMER. *From N. H. Albaugh, Tadmore, O., 1892.* Canes rather coarse and have but few prickles. Berries above medium, roundish with large grains and coarse core. Fruit sub-acid, juicy,

fair flavor and quality. This berry gives promise of being very productive.

REYNER. *From S. R. Alexander, Bellefontaine, O., 1892.* Plants rather large and vigorous, producing large greenish canes with few prickles. Fruit above medium, roundish or oblong, with large grains, sweet, good flavor and quality.

SUCCESS. *From L. W. Carr & Co., Erie, Pa., 1892.* This is one of the most productive blackberries that fruited here for the first time this season. Plants moderately vigorous; canes of a greenish color bearing abundant prickles. Berries medium to large, roundish, with medium to large grains; good in flavor and quality.

WOODLAND. *From W. H. Phillips, Stanton, Ind., 1892.* Plants thrifty, with abundant small prickles. Fruit medium or above; berry roundish with large to very large grains; pleasant flavor and good quality. Very productive as grown here this season.

YIELD OF BLACKBERRIES 1894.

In the following table the yield of the blackberries that fruited at this Station in 1894 is given, together with the season of each variety. Five hills of each were originally set but they have been allowed to grow together so that the yield given is for the matted row. No protection is given the plants so many of the more tender varieties have been winter killed. In such cases, the yield of the remaining plants is given. The date of planting should be taken into consideration when comparing varieties.

TABLE I—YIELD OF BLACKBERRIES, 1894.

Rank as to yield.	When set.	Name.	Total yield. Ounces	In marketable condition.
7	1888	Agawam.....	110	July 23 to Sept. 1
12	1889	Ancient Britton.....	86	" 25 " 1
13	1888	Barnard.....	83	" 23 Aug. 8
4	1890	Carlo.....	126	" 23 " 24
10	1889	Dorchester.....	99	" 23 " 24
19	1889	Early Cluster.....	23	" 13 July 25
6	1889	Early Harvest.....	113	" 23 Sept. 1
3	1888	Early Mammoth (Thompson's).....	149	" 20 " 1
16	1892	Eldorado.....	44	" 23 " 14
1	1888	Evergreen. <i>Oregon Evergreen</i>	381	Aug. 14
		<i>Jewett</i> , see Lovett.		
		<i>Lawton</i> , see New Rochelle.		
14	1888	Lincoln.....	70	" 23 " 6
9	1890	Lovett, <i>Jewett</i>	104	" 28 " 18
17	1891	Luther.....	32	" 23 " 24
11	1889	Minnewaski.....	89	" 23 " 24
5	1889	New Rochelle, <i>Lawton</i>	120	" 23 Sept. 1
11	1888	<i>Oregon Evergreen</i> , see Evergreen.		
		Snyder.....	89	" 20 Aug. 8
15	1888	Stone's Hardy.....	65	" 28 " 14
2	1888	Taylor, <i>Taylor Prolific</i>	197	" 20 Sept. 1
		<i>Thompson's Early Mammoth</i> , see Early Mammoth.		
7	1889	Wachusett.....	110	" 23 Aug. 11
20	1888	Wilson's Early.....	2	" 18 July 25
8	1888	Wilson Junior.....	109	" 20 Aug. 18

The Evergreen was the most productive blackberry fruited here this season. During previous winters the canes have been severely winter killed, but last winter they were not affected by the cold. This variety was noted in the Report for 1893 as bearing fruit of very inferior quality, and this season's experience only tends to confirm our former opinion. The next in rank is Taylor. It was very unproductive in 1893; its fruit is small in size, but of good quality. Early Mammoth which is third on the list was not hurt as much by cold as it has been during previous winters. Its fruit is quite liable to be imperfect and knotty as was noted last year.

The fruit and the habit of growth of Early Mammoth and Wilson Junior are much alike. The canes are low and drooping, and bear larger and more attractive berries, than many of the upright growing kinds. The plants are not perfectly hardy, but their

drooping habit makes them easy to protect. These varieties are very desirable, where they can be grown, on account of the size and quality of the fruit. For this reason it would be well to experiment with them, in a small way at first, to see if they could be made to pay as a commercial crop by giving them winter protection. Bending the canes to the ground and covering them lightly with earth has been found to be a cheap and effective method of protection. Carlo ranks fourth in productiveness. It has not been productive here in previous years. The fruit is of inferior quality and is suitable for neither home or market use. Dorchester was the most productive variety fruited here in 1893; the large crop of last season may have been the cause of its small yield this year.

DEWBERRIES.

The dewberries are much inferior to blackberries, as grown here, in both flavor and quality; yet their large size and attractive appearance will find them a place on the early market. They are very prolific bearers and begin to ripen their fruit ten days or more earlier than the blackberries. The vines are very easily winter killed, but are as easily protected by throwing a few shovelfuls of earth on them as they lie prostrate on the ground. In the spring the vines should be tied up to a trellis, while the new growth is left to trail on the ground, where it remains till it is tied to the trellis the following spring. A convenient form of trellis is made by stretching three wires over the rows, one above the other and about fifteen inches apart. When tied up in this manner the fruit is much easier to pick and injury from contact with the ground is avoided.

BARTEL. *From F. Ford and Son, Ravenna, O., 1888.* This variety is not identical with Mammoth as grown here. Vines not as vigorous as Mammoth. The fruit resembles that variety, but is usually more compact, and of a duller color; grains irregular in size, sub-acid, poor quality.

LUCRETIA. *From F. Ford and Son, Ravenna, O., 1888.* Vines moderately vigorous. Fruit generally smaller than Mammoth with a smaller core, grains large, juicy, sub-acid, poor quality.

MAMMOTH. *From F. Ford and Son, Ravenna, O., 1888.* Vines moderately vigorous. Fruit round or oblong, large size, with very large grains, juicy, sub-acid, poor quality.

TABLE II—YIELD OF DEWBERRIES, 1894.

Rank as to yield. 1894.	When set.	Name.	Yield of row 20 feet long. Ounces.	In marketable condition.
3	1888	Bartel	105	July 10 to Aug. 4.
1	1888	Lucretia	253	" 10 " " 11.
2	1888	Mammoth.....	147	" 10 " " 6.

The Lucretia is the most productive of the three varieties and has the longest fruiting period.

LIST OF BLACKBERRIES AND DEWBERRIES SET IN THE SPRING OF 1894.

Blackberries.

CHILD'S EVERBEARING TREE, from J. L. Childs, Floral Park, N. Y.

WESTERN TRIUMPH, from R. M. Kellogg, Iona, Mich.

Dewberries.

Latimer's Seedling, from J. W. Latimer, Pleasanton, Kas.

SANFORD, from C. W. Graham, Afton, N. Y.

JAPANESE WINEBERRY.

The Japanese Wineberry has been extensively advertised for several years past as a desirable novelty, so it is thought that a brief account of its behavior in this locality will not be out of place here. Plants of this fruit were received in 1892 from R. G. Chase & Co., Geneva, N. Y. They have made a good growth but are only moderately hardy. The canes are covered with a dense growth of long purple bristles which gives them a striking appearance. The fruit is borne in clusters similar to raspberries; as soon as the blossoms fall the long hairy segments of the calyx close over the ovaries, and so remain until the fruit begins to ripen when they recurve and expose the translucent wine colored berries. The light orange color of the inside of the sepals forms a pleasing contrast to the darker colored fruit. The berries are of

medium size compared with raspberries, and crumble very badly. They are sprightly, mild sub-acid but inferior in quality to raspberries, as grown here. The plants have not been even moderately productive as yet. They are propagated by tips.

RASPBERRIES.

Many of the older varieties of raspberries have been thoroughly tested at this station and reported on in previous years. Therefore it has been thought best to discard a large number of them and retain only a few of the standard varieties for comparison with the newer sorts. Information concerning any of these older varieties that have been tested will be cheerfully furnished upon application.

BLACK RASPBERRIES.—NOTES ON VARIETIES.

EUREKA. *From W. N. Scarff, New Carlisle, O.* Has not fruited yet.

Haynes' Seedling. *From I. H. Haynes, Delphi, Ind., 1893.* Fruit of medium size, firm, and somewhat seedy; moderately juicy, mild sub-acid, good flavor and quality. Berries are dull black and unattractive.

KANSAS. *From A. H. Griesa, Lawrence, Kas., 1893.* Fruit medium to large, of good black color, moderately juicy, firm, slightly sub-acid, good flavor, fairly productive.

Manwaring's Seedling. *From C. H. Manwaring, Lawrence, Kas., 1893.* This variety has not yet been fruited at this Station.

MOHLER. *From D. M. Mohler & Co., New Paris, O., 1893.* The plants of this variety resemble the Kansas in general appearance, but are larger and more vigorous. It promises to be very productive but the fruit is not as attractive in appearance as the Kansas. Berries medium to large, of dull black color, firm, juicy, nearly sweet, fair quality.

Most of the black raspberries have been recently transplanted, so their yields are not given. A list of the varieties now growing on the Station plats is given below :

American Everbearing.	<i>Manwaring's Seedling.</i>
Arctic.	<i>Mills' No. 7, see Onondaga.</i>
<i>Brackett's No. 101, see Lotta.</i>	<i>Mills' No. 15, see Mills</i>
Carman.	Mills.
Eureka.	Mohler.
<i>Haynes' Seedling.</i>	Ohio.
Hilborn.	Older.
Kansas.	Onondaga, (<i>Mills' No. 7</i>).
Lotta, <i>Brackett's No. 101.</i>	<i>Smith's No. 2.</i>

Spry's Early.

Hilborn produced a good crop of fruit this year. In 1893 it was reported as being worthy of extended trial on account of its productiveness, vigor and excellent fruit. American Everbearing was moderately productive this season. It produced a few fruits in September but not enough to be of any value. Lotta is only moderately productive of medium sized fruit. Arctic was fruited here for the first time last season; it has been only moderately productive thus far of medium sized fruit. (*Mills' No. 15*), and Onondaga (*Mills' No. 7*), both of which received favorable notice in the report of this Station for 1893, were transplanted that fall, therefore no report can be made on them this year.

RED RASPBERRIES.

The following table shows the yield of red raspberries fruited at this Station in 1894, the per cent of the crop picked before July 13th, and the per cent picked after July 25th. The plants are set in rows twenty-five feet in length, and are allowed to form matted rows at once. Those varieties that produced their first crop this year are not comparable with those that have borne fruit for one or more seasons because they have not yet come into full bearing.

TABLE III—SHOWING RELATIVE PRODUCTIVENESS, AND EARLY AND LATE YIELD OF RED RASPBERRIES IN 1894.

Rank as to yield. 1894.	Name.	When set.	Per cent of crop picked prior to July 13.	Per cent of crop picked after July 13	Yield of matted row twenty-five feet in length. Ounces.
12	Bradywine.....	1892	0	32	34
5	Clarke	1892	5	23	151
*	Cline	1893	—	—	—
*	Crimson Beauty.....	1893	—	—	—
6	Cuthbert	1892	3	21	149
2	Cuthbert (<i>Quinby's Favorite</i>).	1892	3	22	193
*	Early Pride	1893	27	17	60
7	Early Prolific.	1892	18	24	119
1	Harris.....	1889	11	22	29†
10	Miller's Woodland	1892	13	26	76
*	Naomi	1893	—	—	—
*	Olathe (<i>Stayman's No. 5</i>)	1893	0	34	129
8	Pomona	1892	26	12	87‡
4	Pride of Kent.	1892	36	11	165†
*	Pumphrey's No Name	1893	—	—	—
*	Reder	1893	10	23	71
*	Reliance.	1893	24	10	21
11	Royal Church.....	1892	0	36	58‡
	<i>Stayman's No. 5, see Olathe.</i>				
3	Superb	1892	13	24	174
9	Turner	1892	33	7	83

* First crop.

† Yield computed from 80 per cent. of a full row.

‡ Yield computed from 66½ per cent. of a full row.

§ Yield computed from 43 per cent. of a full row.

EARLY RED RASPBERRIES.

The greater part of the red raspberries ripened between the dates of July 13th and 25th. Those varieties that ripened a considerable portion of their crop prior to July 13th may be called early, and those that ripened a considerable portion of their crop after July 25th may be called late for this season.

Table III shows that eight varieties yielded over 12 per cent. of their crop before July 13.

Table IV gives the dates of the first picking together with the yield of these eight varieties.

TABLE IV—EARLY RED RASPBERRIES RANKED ACCORDING TO YIELD PRIOR TO JULY 13, 1894.

Name.	Date of first picking.	Yield before July 13. Ounces.	Total yield. Ounces.	Rank as to total yield.
Early Pride	July 3	16	60	*
Early Prolific.....	June 30	22	119	7
Miller's Woodland	July 5	11	76	10
Pomona	July 3	15	58	8
Pride of Kent.....	June 30	47	131	4†
Reliance	July 3	5	21	*
Superb	July 5	22	174	3
Turner	July 3	27	83	9

* First crop.

† Yield computed from 80 per cent. of a full row.

Superb was noted last year as being very unproductive. Early Prolific is moderately productive of fruit of good quality and is remarkable for its long fruiting period, being classed with both early and late varieties. Pomona made a good showing this season as it has done in previous years. It seems to be worthy of introduction in this locality. Turner is an old variety and very hardy. Its fruit is inferior to Cuthbert in size and firmness.

LATE RED RASPBERRIES.

Classing those varieties as late that yielded one-fourth or more of their crop after July 25th, table III shows a list of eleven varieties which are given in the following,

TABLE V—LATE RED RASPBERRIES RANKED ACCORDING TO YIELD AFTER JULY 25, 1894.

Name.	Date of last picking.	Yield after July 25 Ounces.	Total yield. Ounces.	Ranked as to total yield 1894.
Brandywine	Aug. 4	11	34	12
Clarke.....	Aug. 8	35	151	5
Cuthbert.....	Aug. 8	31	149	6
Cuthbert (<i>Quinby's Favorite</i>).....	Aug. 8	44	193	2
Early Prolific	Aug. 8	28	119	7
Harris†.....	Aug. 8	53	232	1
Miller's Woodland.....	Aug. 4	20	76	10
Olathe (<i>Stayman's No. 5</i>)*.....	Aug. 8	44	129	—
Reder*.....	Aug. 8	16	71	—
Royal Church†.....	Aug. 8	9	25	11
Superb.....	Aug. 8	43	174	3

† Yield computed from 80 per cent. of a full row.

‡ Yield computed from 43 per cent. of a full row.

* First crop.

Harris yielded much the largest crop of any of the red raspberries fruited here in 1894, but the plants were set in 1889, so have become well established, which fact should be taken into consideration when comparing its yield with other varieties which have not been set so long. It produces excellent fruit which resembles Cuthbert in size and quality. Cuthbert and Quinby's Favorite appear to be identical, unless, as was suggested in 1893 Quinby's is an improved strain of Cuthbert. Rows of both of these berries were fruited this year under exactly similar conditions which resulted in Quinby's taking second rank as to yield while Cuthbert ranked sixth. Clarke in 1893 was noted as "a well known old variety and one of the most productive tested at this Station." It ranks fifth in productiveness for 1894. Royal Church has given very good results in previous years, but this year on account of being recently transplanted it has fallen much below its average.

PURPLE RASPBERRIES.

Most of the purple raspberries have been recently transplanted so that only the one variety, Addison, bore fruit this season. The following list gives the names of the varieties that are now growing on the Station plats.

Addison.

Babcock No. 1.

Cardinal.

Columbian.

Shaffer.

Smith's Purple.

Addison is only moderately productive, the yield of five hills now in a matted row was 106 ounces. The fruit is of good quality, having the flavor of the wild red raspberry, while the plants have the habit of growth of the black raspberries. Columbian was transplanted after fruiting in 1893, so no farther report can be given on it at this time as we have no plants in bearing.

YELLOW RASPBERRIES.

A list of the yellow raspberries now growing on the station plats is given below.

Caroline.	Golden Queen.
Champlain.	Golden Thornless.
Crystal, (<i>Crystal White</i>).	Orange.

Vermont.

Of the three varieties that produced fruit this year Caroline is first in productiveness as it was last year, ranking about with Cuthbert (Quinby's). Golden Thornless is an old variety which produces fruit of good quality. Vermont was one of the most productive of the yellow raspberries in 1893; it was only moderately productive this year. None of the yellow berries are suitable for a market crop, but many of them are very desirable for the home garden.

LIST OF RASPBERRIES SET IN THE SPRING OF 1894.

- Babcock's seedling*, from D. W. Babcock, Dansville, N. Y.
Babcock No. 3. " "
Babcock No. 5. " "
Babcock No. 5a. " "
Babcock No. 9. " "
Beckwith's seedling, from Prof. M. H. Beckwith, Newark, Del.
 COLUMBIAN, from Jos. T. Thompson, Oneida, N. Y.
 CROMWELL, from W. D. Barns, Middle Hope, N. Y.
 ENGLISH GIANT, from W. D. Barns, Middle Hope, N. Y.
 EUREKA, from A. M. Purdy, Palmyra, N. Y.
 GOLDEN PRAGUE, from W. D. Barns, Middle Hope, N. Y.
 HOPKINS, from A. M. Purdy, Palmyra, N. Y.
 I. X. L., from Chas. Schlessler, Naperville, Ills.
 KENYON, from O. A. Kenyon, McGregor, Ia.
 KING, from Cleveland Nursery Co., Rio Vista, Va.
 LOUDON, from F. W. Loudon, Janesville, Wis.
Morrison's seedling, from J. P. Morrison, Forrestville, N. Y.
 PALMER, from Chas. Mills, Fairmount, N. Y.
 PIONEER, from B. D. Garvin & Son, Wheeling, W. Va.
Poscharsky No. 3, from F. W. Poscharsky & Son, Princeton, Ill.
Poscharsky No. 9. " "
Poscharsky No. 15. " "
 REDFIELD, from J. Wragg & Son, Waukee, Ia.
 RED SWEET, from W. D. Barns & Son, Middle Hope, N. Y.
 SUPERLATIVE, from Ellwanger & Barry, Rochester, N. Y.
 TALBOT PROLIFIC, from M. I. Ellis, Norwood, Mass.
Townsend's No. 2, from Geo. Townsend, Gordon, O.

RASPBERRY ANTHRACNOSE.

In the spring of 1894 a communication was received from Mr. S. A. Hosmer of Clifton, New York, in regard to anthracnose on raspberries and kindly offering the Station the remains of his once large plantation to use in experimenting with treatment for the disease.

The plantation at one time consisted of twenty-five acres and was regarded as producing one of the most paying crops of the farm; but through the ravages of anthracnose the acreage was yearly reduced until now scarcely three acres of badly infested plants remain. Seemingly every cane was diseased, immense scabs and blotches from four to eight inches in length and reaching nearly around the cane, were not uncommon. The present plantation, consisting entirely of Gregg, was set out in the spring of 1890; it comprises about three acres of gravelly loam situated on a gentle southern slope. The rows, fifty in number, run north and south.

PLAN OF THE EXPERIMENT.

Primarily the experiment was undertaken to see if the disease could be successfully combatted; secondarily, different solutions were used for the first treatment, so that a comparison might be made as to their effectiveness in treating the disease.

Knowing that a remedy for any fungus disease must be preventive rather than a cure, and that fungi begin their work very early in the spring, it was planned to give the first treatment before the leaf buds opened; at this time strong solutions could be used as there would be no foliage to be injured; accordingly the rows were treated as follows: The first three with copper sulphate, three pounds to eleven gallons of water; the next three with a saturated solution of iron sulphate in water, while the next three were reserved for checks. This plan was carried on throughout the plantation, except the last two rows, making in all eighteen rows treated with the copper sulphate, fifteen rows treated with the iron sulphate, and fifteen untreated, or check rows; of the last two rows one was treated with a ten per cent solution of sulphuric acid in water, the other with ten per cent of sulphuric acid added to a saturated solution of iron sulphate. After the first spraying, all treated rows were sprayed alike.

DATES OF SPRAYING.

The first spraying was made April 18th, just as the leaf buds were beginning to swell. All of the different mixtures were applied on the same day. That evening a heavy rain set in which lasted three days. The second spraying was given May 1st. All of the treated rows were sprayed alike from this time on with Bordeaux mixture, using one pound of copper sulphate to eleven gallons of the mixture. At this time the leaves were about one-fourth grown.

The next treatment was made May 16. The leaves were nearly full grown, while the largest of the new canes were about eight inches in height. The work of the fungus on the new canes was now noted for the first time; a few of the small characteristic spots were seen on the new shoots where they grew close to a diseased spot on an old cane. Immediately after this spraying was given the severe spring rains set in which lasted intermittantly for twenty-one days.

On May 30 a fourth spraying was given. It was found that the previous spraying had seriously injured both the fruit and foliage.

It was found that by a mistake in the capacity of a measure used in making the Bordeaux mixture for the third spraying, it had been made much stronger than was intended. The injury was probably due to this fact. Raspberries on the station plats that were given similar treatment throughout the season, except that in no application was the mixture used stronger than one pound of copper sulphate for eleven gallons of the mixture, were not injured by the spray. Raspberry foliage was not found to be particularly liable to injury from Bordeaux mixture at this strength contrary to the experience noted in Bulletin No 6 of the Ohio Experiment Station, 1891, p. 120. However, as the new canes are the only parts of the plants that need protection, the spray should be directed towards them alone.

A fifth treatment was given on June 21st. The difference in the amount of disease, on the treated and untreated rows was very noticeable at this time. Nearly every fruiting stem and new cane on the unsprayed plants was attacked by the anthracnose while on the unsprayed rows the appearance of the disease was much less noticeable.

After the fruiting season was over the old canes, contrary to the usual practice, were removed and burned, when the last spraying for the season was given on August 9th.

The plantation was visited on Nov. 22d and the plants of both the sprayed and unsprayed rows were found to have made a very vigorous growth. The canes in the treated rows were nearly free from disease while those that were not sprayed are still very badly affected.

The same line of treatment will be carried on throughout the season of 1895. The conclusions reached at that time will be published, together with details of the experiment.